

MINERS RAVINE

A. Water Quality Data

1. 2001 Central Valley Regional Water Quality Control Board. The Central Valley Regional Water Quality Control Board (Regional Board) has collected water quality data for several sites in the Miners Ravine Watershed (defined in this report as upstream of the confluence with Secret Ravine) since October of 2000. During October 2000 through February 2002, the Regional Board staff conducted approximately monthly monitoring at the Auburn Folsom Road crossing. The Regional Board collections also included pesticide scans with no problems noted. Metals data indicate that the concentration of copper (0.008 mg/l) in a sample collected at Dick Cook Road in November 2001 exceeded the standards (Table 1) at a water hardness of 50 mg/l. While no hardness measurements were taken at the time of sampling, contemporary measurements indicate that hardness must have been near 50 mg/l. Data on hardness in the stream over the course of the one-year of monthly monitoring ranged from 28-84 mg/l, which demonstrate that the water quality standards at a hardness of 50 mg/l are applicable. Measurements of copper at the confluence with Secret Ravine in November of 2001 and 2002 were below detection limits. **Source: Central Valley Regional Water Quality Control Board, unpublished data.**

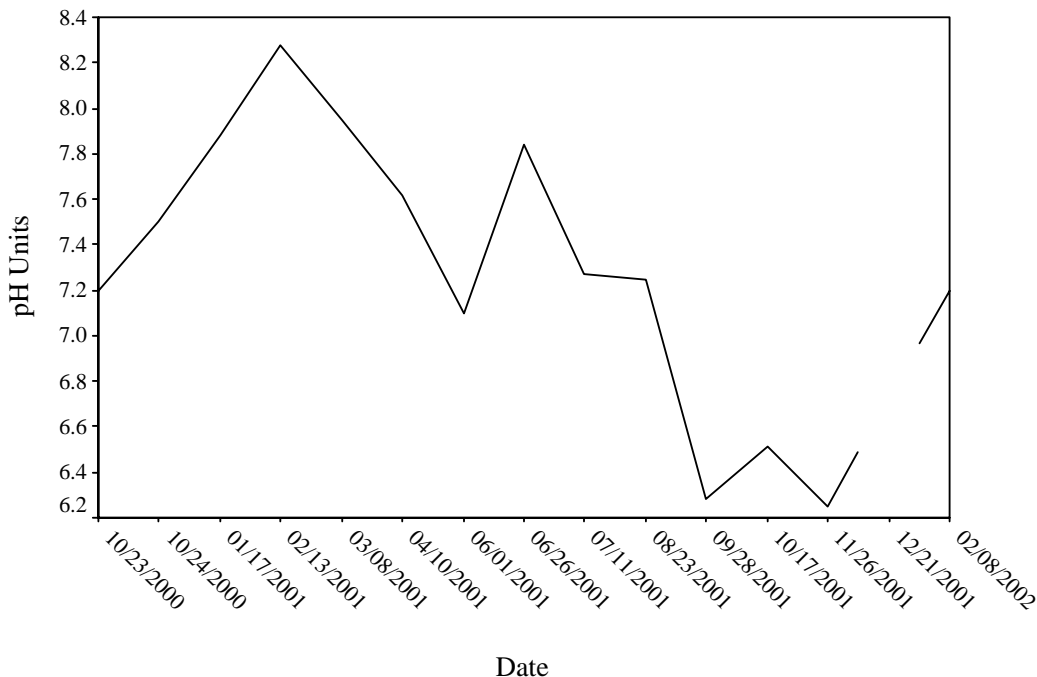
Table 1. California Toxics Rule water quality standards for selected metals, based on a hardness of 50 mg/l as CaCO₃.

Metal	Maximum Concentration (Acute) (mg/l)	Continuous Concentration (Chronic) (mg/l)
Barium	No standard	No standard
Cadmium	0.002	0.0013
Copper	0.007	0.005
Zinc	0.067	0.066

Source: California Toxics Rule (water quality objectives)

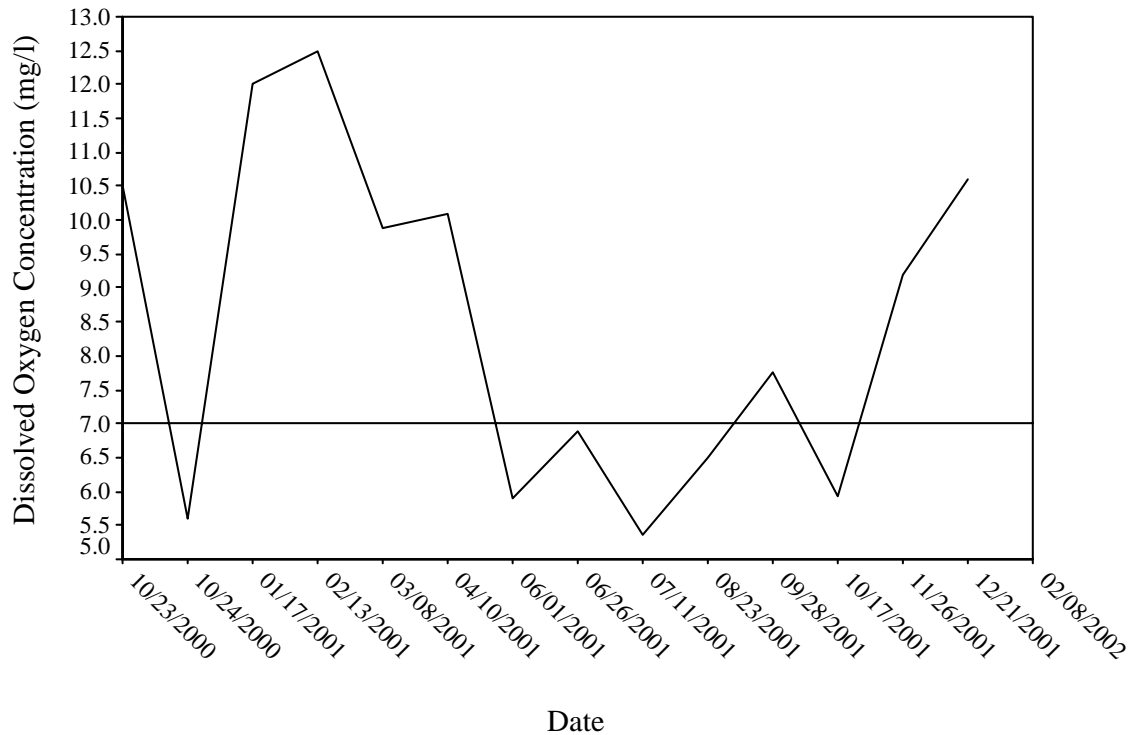
Three other water quality parameters are also of concern. The first is the fluctuations in pH values over the course of a year. This is the same pattern noted in adjacent streams and watersheds. Figure 1 displays the pH data from the Regional Board data taken at Auburn Folsom Road.

Figure 1. Monthly time series of pH data taken in Miners Ravine at Auburn Folsom Road during the period October 2000 to February 2002.



The second parameter of concern is the annual fluctuation in dissolved oxygen concentration recorded at this same site (Regional Board; Figure 2). The concern is that summer and early fall concentrations drop below the recommended level of 7.0 mg/l for anadromous fish. While the minimum concentration recorded is 5.35 mg/l, which is still above the absolute minimum recommended for coldwater fisheries, this is a one-time grab sample. Most of these summer dissolved oxygen samples were collected in the afternoon (1300-1600 hrs), which is the period of time when dissolved oxygen concentrations would be near or at their daily maximums. No data is recorded for the time period 0300-0400 hours when dissolved oxygen concentrations would generally be at their daily minimums. Additional seasonal and diel sampling should be conducted at multiple locations to determine the extent of the problem, if any.

Figure 2. Monthly time series of dissolved oxygen concentration taken in Miners Ravine at Auburn Folsom Road during the period October 2000 to February 2002. Note the reference line at 7.0 mg/l, which is the recommended minimum concentration for coldwater fisheries.



2. Dry Creek Conservancy Monitoring Data. The Dry Creek Conservancy (DCC) has conducted periodic “first flush” and/or quarterly monitoring upstream of Cottonwood Dam, at Dick Cook Road, and at the confluence with Secret Ravine. A variety of parameters are collected, but the data are not comprehensive or systematic for all parameters. Data from the Dry Creek Conservancy are thus inappropriate for use in trend analysis or to identify general problems. However, although only one sample of nitrate and orthophosphate has been collected in the watershed (November 2002 at the confluence with Secret Ravine), the ratio between the two constituents was near 1:1. While the overall concentrations (0.67 and 0.72 mg/l for nitrate and orthophosphate, respectively) were not critically high, there is cause for concern. First, this sample was collected in November when nutrient input to the stream is usually near its low point for the year. Second, no sampling has occurred during the summer time period in this watershed, and thus summer nutrient levels are unknown.

The DCC data are also probably consistent with summer concentration data from recorded in downstream Dry Creek, where nitrate levels have exceeded 4.0 mg/l. Also, the DCC data indicate that the desirable ratio of nitrate to phosphate of 10:1, with nitrate concentrations no greater than 1.0 mg/l, may not be present in this stream during some portion of the year. It appears that phosphorus is not a limiting nutrient at this time and that additional inputs of nitrates from sources such as runoff and lawn fertilizers could create biostimulation and declines in

dissolved oxygen during the summer and early fall time period. The Regional Board's dissolved oxygen data presented in Figure 2 also may be an indication that that is occurring. In analyzing the Regional Board and DCC data, it should be noted that the data on dissolved oxygen and nitrate/orthophosphate are from different stations miles apart and there is no summer data for nitrates/orthophosphates or diel dissolved oxygen data to support any hypothesis. Additional sampling to clarify the situation should be a high priority. A complete set of all water quality data is available electronically from the DCC, while Bailey Environmental has a complete copy of the provisional data. **Source: Dry Creek Conservancy, unpublished data.**

B. Water Temperature Data

Detailed long-term water temperature data is limited to hourly monitoring funded by Placer County and conducted by Bailey Environmental (initiated May 2003) and 1999-2003 data from recent sampling by California Department of Fish and Game (Rob Titus) from a monitoring site near Dick Cook Road. Titus has additional data from previous years but it is not currently available. All data retrieved to date is plotted in the figures below. Since daily maximum, minimum, and/or mean temperatures individually are of little value, I have chosen to plot all data points. Therefore, I have split the year into time periods that roughly correspond to:

Fall-early winter: September through December: primary fall-run chinook salmon spawning period is November-December.

Winter-spring: January through April: fall-run chinook salmon incubation and rearing and steelhead spawning, incubation, and rearing.

Late spring-summer: May to September: summer rearing for steelhead juveniles.

Data plots for these time periods are presented below to permit assessment of the potential of Miners Ravine to support chinook salmon and/or steelhead trout spawning and rearing. A variety of localized data and literature on water temperature and salmonids was reviewed to establish general parameters of temperature effects on various life history stages for both chinook salmon and steelhead trout. There is fairly substantial variation in temperature effects noted for most life history stages. However, both chinook salmon and steelhead have a highly adaptable physiology and ability to seek thermal refuge during part of the day which may allow them to tolerate and/or avoid lethal temperatures. Some of the literature sources cite criteria from others and some of the data is based on fish captures with water temperature taken concurrently. Two tables with data and reference are included in Appendix A of this report. Based on this review, the following criteria have been used to indicate what life history stages a particular stream may support at any given time:

<u>Chinook Salmon</u>	<u>°C</u>	<u>Steelhead Trout</u>	<u>°C</u>
Egg and fry development	14.4 (58 °F)	Egg and fry development	14.4 (58 °F)
Juvenile rearing	21.1 (70 °F)	Juvenile rearing	22.2 (72 °F)
Adult migration	21.7 (71 °F)	Adult migration and holding	22.2 (72 °F)

Accordingly, reference lines for 14.4 °C and 22.2 °C have been provided on Figures 3-10 to roughly represent the water temperatures suitable for salmonid spawning migration, egg and fry development, and juvenile rearing.

1. 1998-2003 Sampling in Miners Ravine by Rob Titus, California Department of Fish and Game: Titus' memorandum presents information on daily maximum and average water temperatures at more than one location in Miners Ravine over the period June 1, 1999 through August 31, 1999. He indicates that water temperatures spiked at 77 °F on three occasions in July 1999 and averaged 70 °F over the three-month period. No detailed data are presented, but Titus must have much more data available. In addition Titus provided detailed data (Figures 3-6) from a monitoring site near Dick Cook Road for the period July 30, 2002 through August 27, 2003. Titus has additional data for previous years. These data will be made available by mid-December 2003. The data will be provided to Placer County when it becomes available.
Source: Memorandum, dated November 5, 2001, and unpublished data from CDFG Biologist Rob Titus, CDFG, Region 2 files.

Figure 3. Water temperature time series for Miners Ravine at the Dick Cook Road crossing, for the period May 30 through August 31, 2002. Temperatures are suitable for juvenile rearing.

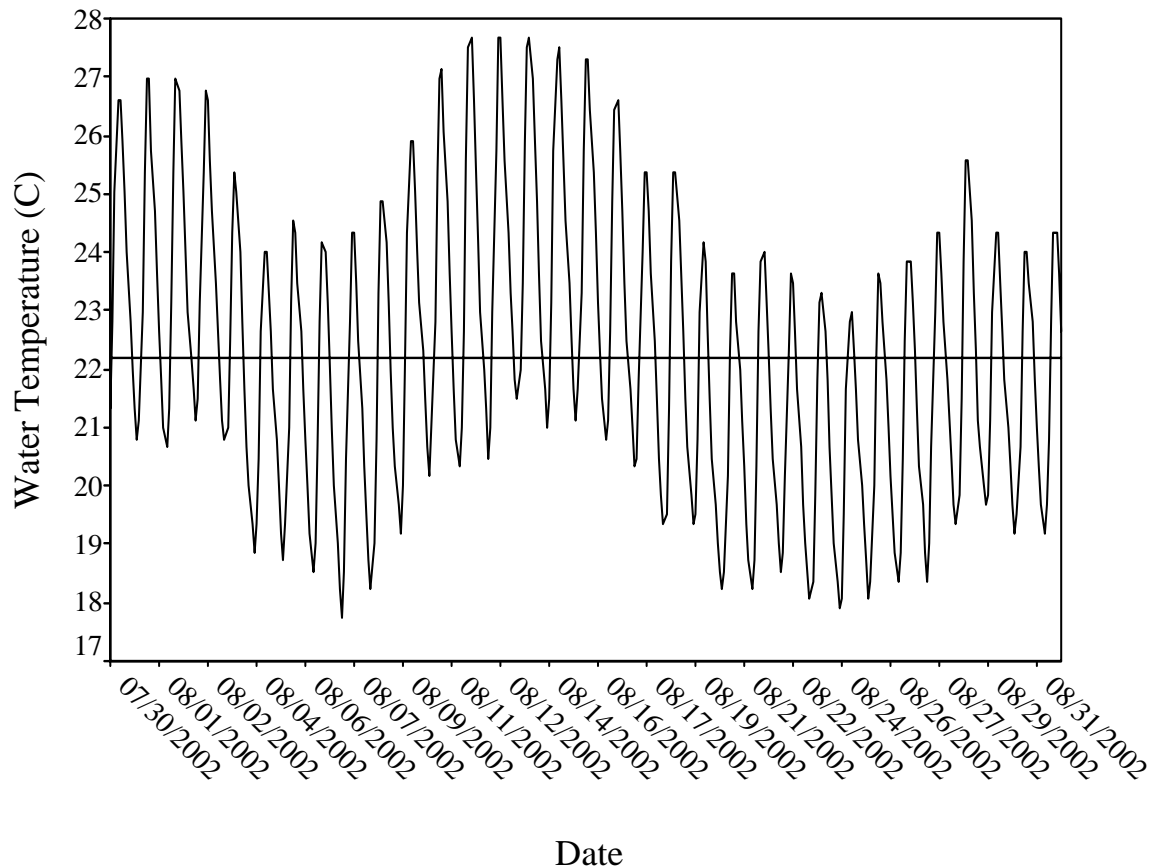


Figure 4. Water temperature time series for Miners Ravine at the Dick Cook Road crossing, for the period September 1 through December 31, 2002. Temperatures are suitable for juvenile rearing and adult spawning.

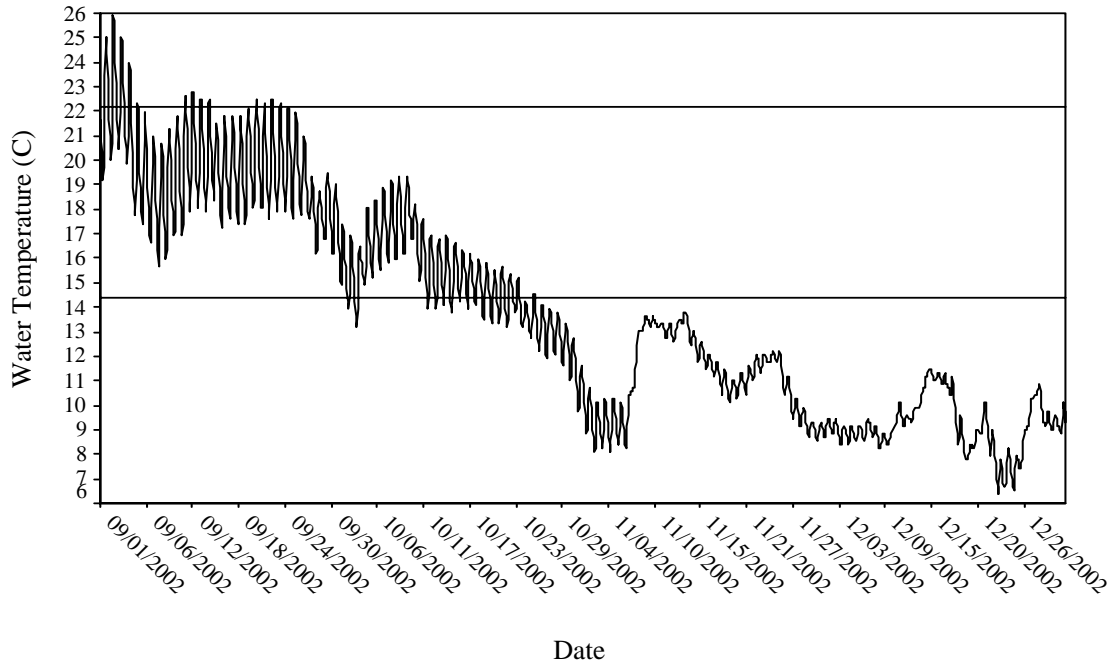


Figure 5. Water temperature time series for Miners Ravine at the Dick Cook Road crossing, for the period January 1 through April 30, 2003. Temperatures are suitable for juvenile rearing and adult spawning.

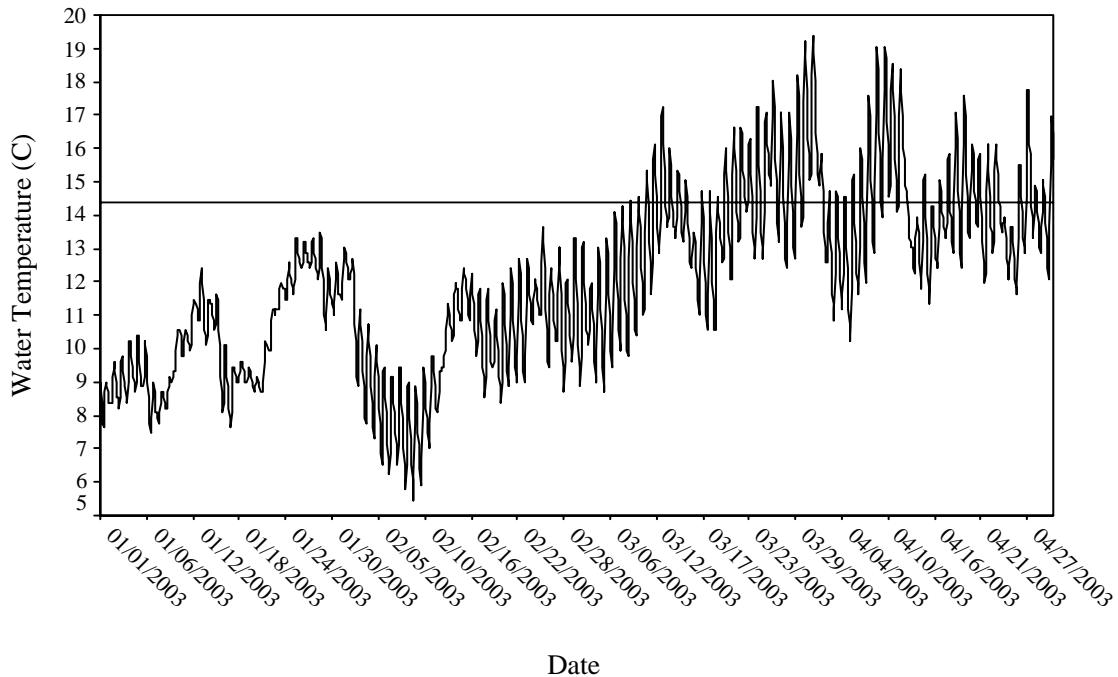
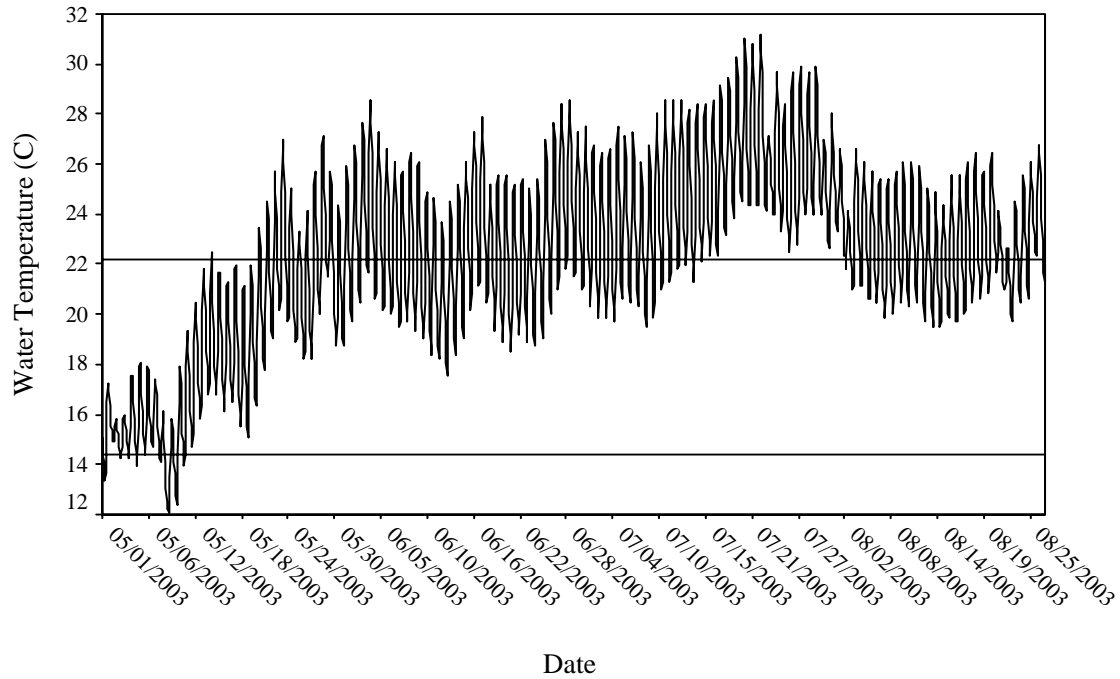


Figure 6. Water temperature time series for Miners Ravine at the Dick Cook Road crossing, for the period May 1 through August 27, 2003. Temperatures are suitable to marginal for juvenile rearing.



2. Water Temperature Information from Bailey Environmental May to August 2003:

In May 2003, Placer County contracted to add additional stations on Miners Ravine. Stations were added at the Miner Ravine Road Crossing, Barton Road Crossing, Cavitt-Stallman Road Crossing, and at the Olympus Point development in Roseville behind the United Artists theatre complex. Figures 7-10 display all of the data to date (which has also been delivered to the County in electronic format). **Source: Bailey Environmental, unpublished data.**

Figure 7. Water temperature time series for Miners Ravine at the Miner Ravine Road crossing, for the period May 31 through August 5, 2003. Temperatures are marginal for juvenile rearing.

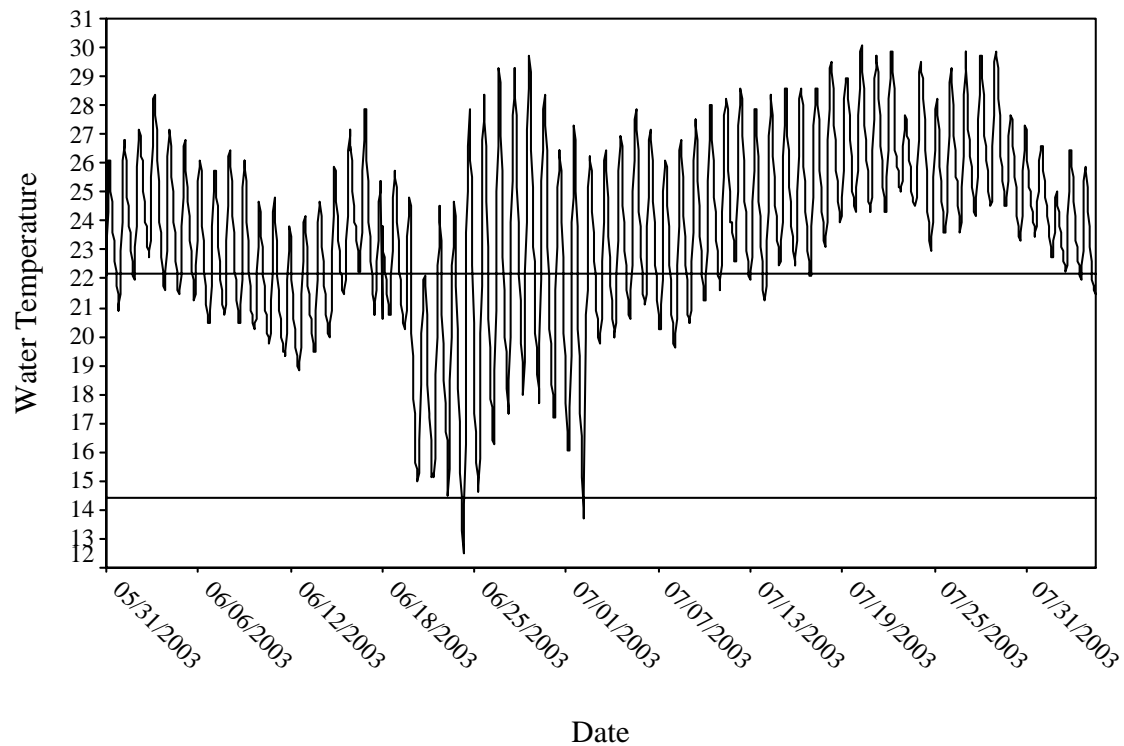


Figure 8. Water temperature time series for Miners Ravine at the Barton Road crossing, during the period June 5 through August 5, 2003. Temperatures are marginal to unsuitable for juvenile rearing, depending on the availability of thermal refugia.

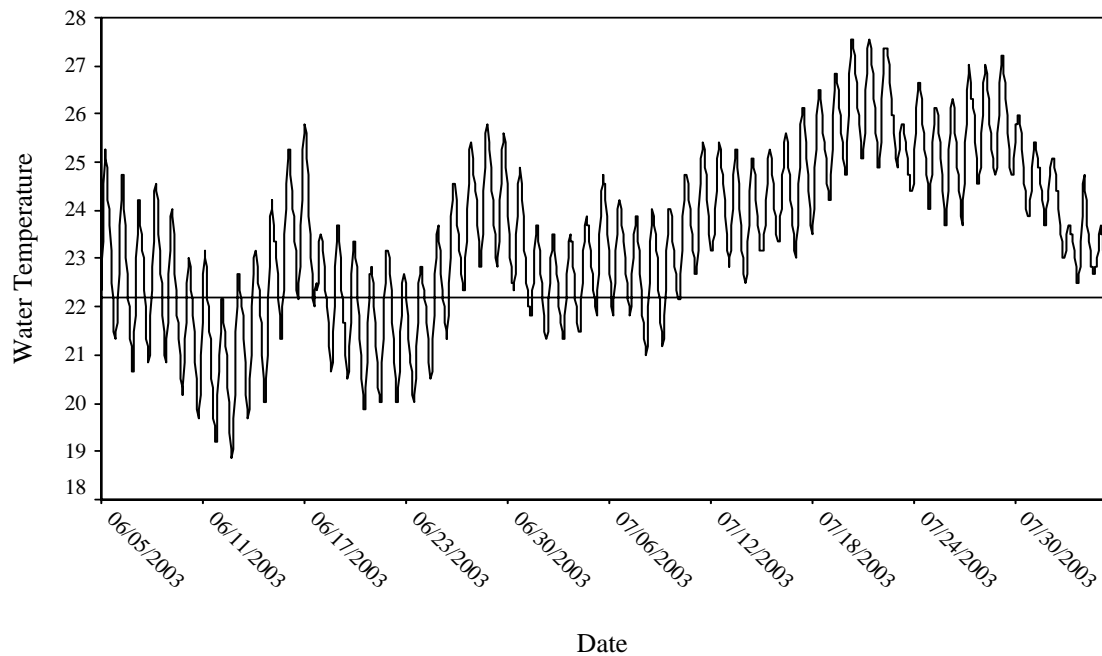


Figure 9. Water temperature time series for Miners Ravine at the Cavitt-Stallman Road crossing, May 31 through August 5, 2003. Temperatures are marginally suitable for juvenile rearing, depending on the availability of thermal refugia.

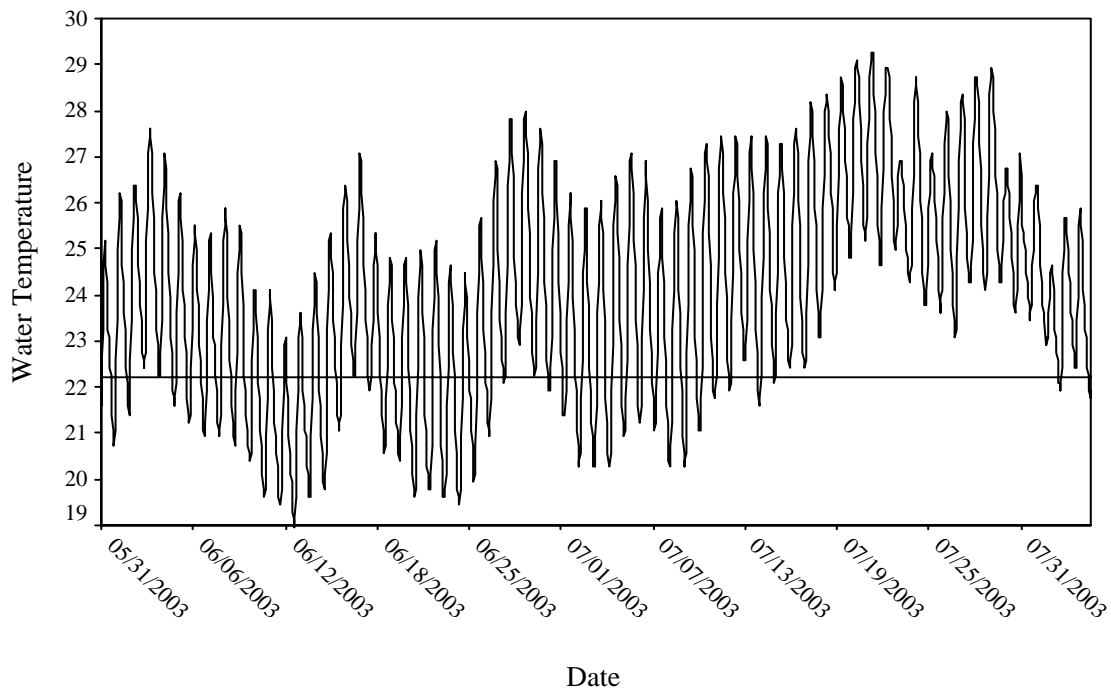
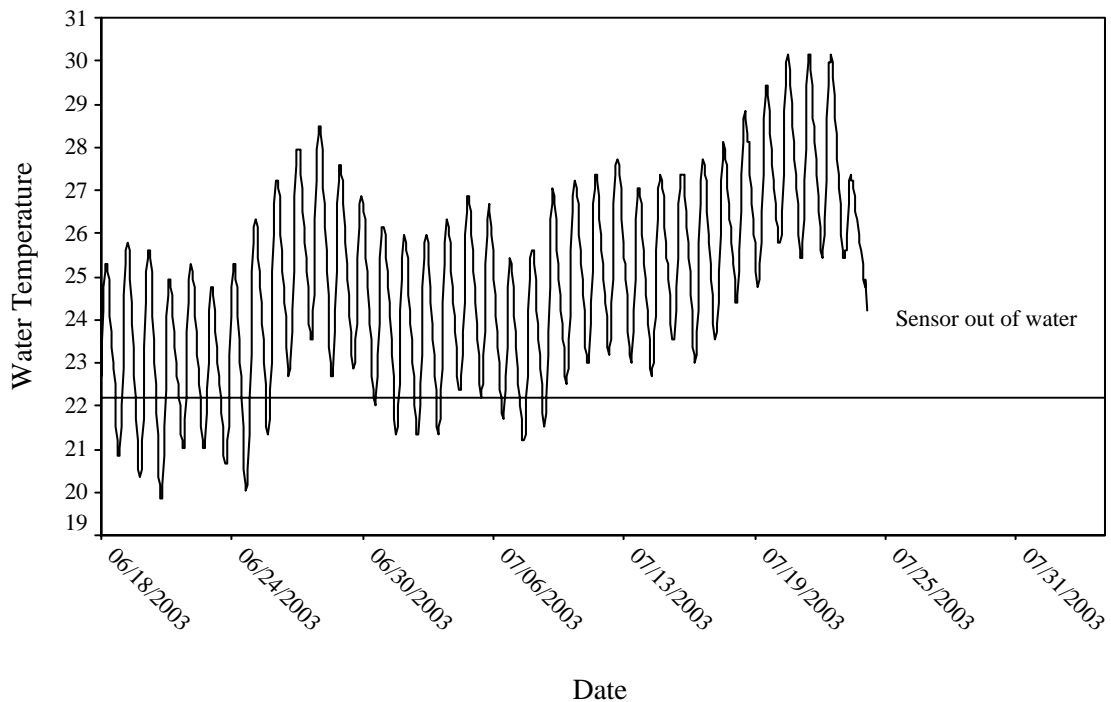


Figure 10. Water temperature time series for Miners Ravine at the Olympus Point site, during the period June 18 through July 24, 2003. Temperatures are marginal to suitable for juvenile rearing, depending on the availability of thermal refugia.



C. Benthic Invertebrate Data

Members of the Dry Creek Conservancy conduct the sampling program for benthic macroinvertebrates. Sampling data from 2000 at a single and unidentified site and two sampling sites in 2001 (Dick Cook Road and near the confluence with Secret Ravine) are presented in Appendix Dry Creek 1. These data indicate a high percentage of pollution tolerant organisms, with almost no organisms associated with cleaner waters. These results are not unexpected given the urban nature of the stream and the amount of sediment deposited in the channels of both streams. **Source: Dry Creek Conservancy, unpublished data.**

D. Physical Habitat Data

Physical habitat data consists of a single detailed study and several partial evaluations for Miners Ravine:

1. 1992-1993 Habitat Inventory by David Vanicek, Professor at California State University, Sacramento: The habitat inventory was limited to one reach [*Vanicek's report describes two reaches for Miners Ravine, upper (UMR) and lower (LMR), with the lower reach running from the Secret Ravine confluence downstream to the Antelope Creek confluence. However, I have described the lower reach in the Dry Creek analysis, using the reach identifiers from the 2002 Miners Ravine Habitat Assessment report by the Department of Water Resources*]. An explanation of the terminology used in the reach descriptions follows the actual descriptions. Vanicek describes this 4030 meter reach [UMR] as follows:

"Reach UMR: Reach runs from the confluence with Secret Ravine upstream 4030 m to the city limit, which is about half way between Roseville Parkway and Sierra College Blvd. Description: Riffles, flatwater, considerable pool habitat due to many beaver dams; several marginal spawning sites in lower reaches; much overhanging vegetation; various low water barriers; low flow in summer a constraint; Overall quality: 4."

Vanicek defines flatwater as the same as would be considered a glide in most other methodologies. **Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993, Copy from CDFG files, Region 2.**

2. 1997 Spawning Gravel Survey by John Nelson, Department of Fish and Game: Nelson surveyed the stream from the confluence with Secret Ravine to approximately 1.5 miles upstream in 1997. He visually estimated the amount of spawning gravel 2-13 cm in diameter (3/4-5") and percentage of embeddedness. His conclusions were that the quantity of spawning gravel was limited and that embeddedness was >50%. **Source: 9/27/97 Memorandum from John Nelson, CDFG, Region 2 files.**

3. November 2001-February 2002 Habitat and Fish Passage Assessment by Department of Water Resources: Department of Water Resources surveyed 12.9 miles of the main channel from Secret Ravine upstream to near where King Road intersects Auburn Folsom Road in Loomis. This survey was conducted using a Level II Department of Fish and Game

survey protocol. Sampling frequency was based on three habitat types (pool, riffle, glide) with each third occurrence of a particular habitat type receiving full documentation. Summary information is presented on a variety of parameters and includes a list and evaluation of potential fish passage impediments or barriers (potential barrier information will be presented in the fish passage section of this report). Specific habitat parameters measured included:

1. flow at the time of survey
2. habitat type
3. particle embeddedness
4. in-stream cover
5. substrate composition
6. canopy
7. observations of live salmon or carcasses

Key data from the Department of Water Resources report include:

- Substrate composition was recorded as gravel (particle diameter 0.08-2.5”) and cobble (2.5-10”). These distinctions are too gross to allow for determining the potential quantity and spatial extent of sediments suitable for steelhead and chinook salmon spawning.
- The entire channel has at least 25 percent canopy cover.
- Table 5 shows that 44% of the channel length surveyed is glide habitat, with 35% pools and 21% riffles. Unfortunately, the summary data and Map 3 do not permit an assessment of the geographic distribution of the habitat types. In addition, it is not possible to characterize individual habitat types and the change in types from downstream to upstream. More detailed information is probably available from the author.
- Mean substrate embeddedness for the three habitat types is 54%, 66%, and 83% for riffles, glides, and pools, respectively.
- Thirteen different in-stream cover types were recorded, but each of the three habitat types is dominated by only 3 of the 13 cover types. Somewhat surprising is the large percentage of large woody debris, boulders, and overhanging branches that make up the in-stream cover.
- Dominant substrate composition for the three habitat types ranges from 51-78% sand, silt or clay. This indicates an extremely heavy sediment load in the channel.
- Approximately 90% of pools, 65% of glides, and 35% of riffles are greater than 2 ft. deep, which indicates potentially good rearing and holding habitat for juvenile salmonids.

Source: Miners Ravine Habitat Assessment, Department of Water Resources, Chris Lee, author, October 2002.

4. 2003 Foot Survey by Randy Bailey, Bailey Environmental: During January and February of 2003, I conducted two foot surveys for chinook salmon from the confluence with Secret Ravine upstream to the bicycle path crossing near Orivetto Drive in Roseville [*the 2002 Miners Ravine Habitat Assessment states that in 1965, Eric Gerstung from the Department of Fish and Game found live salmon and carcasses during the period mid-February through mid-March in Miners Ravine. I conducted these surveys to confirm this conclusion. In October 2003, I discussed the data with Chris Lee (author of the report) to ascertain where he had found the records. We reviewed the information and determined that he had misinterpreted Gerstung's data, which was really a fry trapping program.*]. While no quantitative data were collected, my analysis of this reach of Miners Ravine is as follows:

This reach of stream covers about 2 linear miles and contains a variety of habitat types. Probably 25-30% of the length has overhanging vegetation, ranging from dense clumps of blackberry to oak trees. There are numerous pools (formed by beaver dams), natural deposition areas, and some bedrock features. The bottom substrate is fairly large cobble, mostly > 6" in diameter, which makes it unsuitable for chinook salmon and steelhead spawning, since in this watershed these fish tend towards the small size for their species. Also, the gravel/cobble substrate is heavily embedded with sand and silt-sized particles. There are some locations where habitat complexity is good and if water temperatures were suitable, would constitute good rearing habitat for salmonids. However, the wetlands complex near Orivetto Drive may be a major contributor to high summer water temperatures downstream. Overall, this reach may be characterized as fair to good habitat for chinook salmon, with the potential to become excellent habitat with some source control on sediment and a reduction in gravel diameter and embeddedness. **Source: Randy Bailey, Bailey Environmental, pers. comm.**

5. 2003 Placer County Stream Videography Project: On March 12, 2003 Miners Ravine was videotaped from the air. While the footage is informative, the amount of riparian canopy limits the effectiveness of this source in analysis of Miners Ravine, particularly when compared to the detailed information contained in the 2002 Department of Water Resources report.

E. Fishery Resource Data

1. Documented Fish Species Present in the Stream

Goldfish	Hitch
Lamprey sp.	Golden shiner
Largemouth bass	Sacramento sucker
Sacramento perch	Brown bullhead
Green sunfish	Bluegill
Fall-run chinook salmon (native)	
Fall-run chinook salmon (introduced)	
Steelhead/rainbow trout	

Sacramento pikeminnow (formerly known as Sacramento squawfish)

Source: California Department of Fish and Game, Region 2 files; DEIR Northeast Roseville Specific Plan, City of Roseville, October 1986; Placer County Flood Control and Water Conservation District, FPEIR Dry Creek Water Flood Control

Program, October 1994; November 5, 2001 Memorandum from CDFG Biologist Rob Titus, CDFG, Region 2 files; May 25, 1965 Memorandum from CDFG Biologist Eric Gerstung, CDFG, Region 2 files.

2. Fish Stocking Records

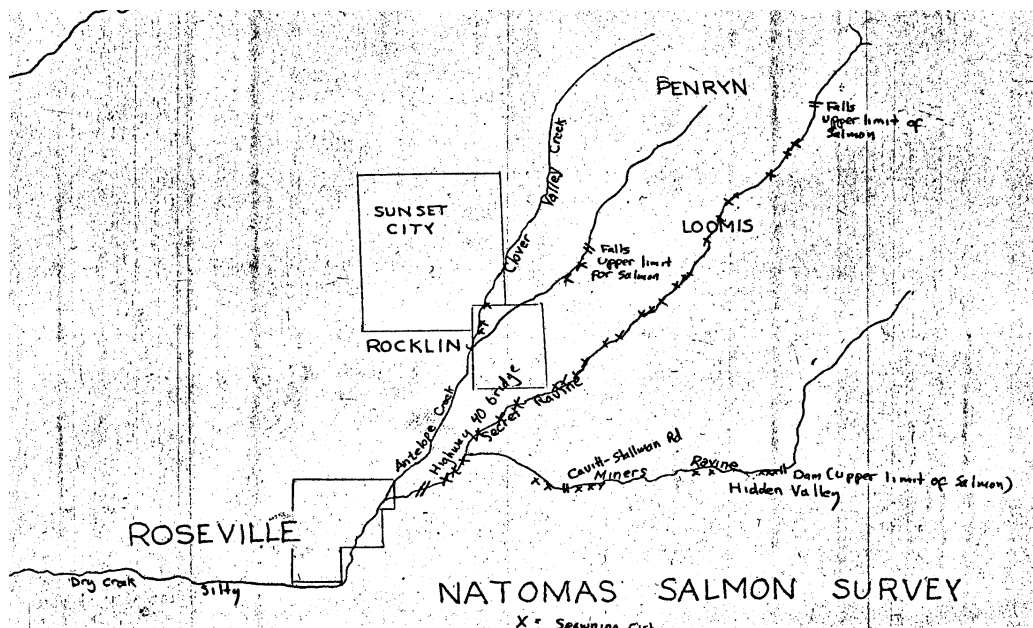
Only two records of fish stocking were found in Department of Fish and Game files. These records are:

- 1/12/89 – 100,678 Feather River Fish Hatchery origin fall-run chinook salmon fry, weighing 1,072 fish/lb. (37 mm mean length) at Sierra College Blvd.
- 2/19/93 – 50,095 Nimbus Fish Hatchery origin fall-run chinook salmon fry, weighing 1,165 fish/lb. (36 mm mean length) at Tall Pines Drive.

3. Adult Spawning Timing, Distribution, and Population Estimates

- **1964 Fall-run Chinook Salmon Spawning Survey by Eric Gerstung:** Gerstung conducted a survey of 1,000 ft. of stream (500 ft. near Cavitt Stallman Road and 500 ft. in “Hidden Valley”) on 11/23/64. Figure 11 shows the sections surveyed. He reported 3 carcasses and 2 live fish at Cavitt Stallman Road and 4 carcasses and 1 live fish in Hidden Valley. He estimated the run size to be 100 fish and indicated that the run size was similar to 1963, although no specific reference to any particular stream was noted. Water clarity was reported as clear and flow estimated at 10 cfs. **Source: May 25, 1965 memorandum in CDFG, Region 2 files.**

Figure 11. Location of 1964 salmon spawning surveys conducted by Eric Gerstung. This figure shows that he found fish spawning in Miners Ravine.



- **December 6, 1985 Spawning Survey:** Miners Ravine was surveyed for fall-run chinook salmon on 12/6/85. The stream was surveyed from the confluence with Antelope Creek to approximately 1.5 miles upstream [*This stream reach includes the segment identified by Vanicek as “Lower Miners Ravine” and included in this document as part of Dry Creek. However, results of this particular spawning survey are reported here and not in the Dry Creek analysis*]. No live fish were seen, but five female carcasses and one male carcass were seen and measured. The five female carcasses measured 54, 60, 64, 65, and 83 cm fork length; while the male carcass was 59 cm fork length. **Source: 12/19/85 Memorandum from CDFG Biologist Phil Hanson, CDFG, Region 2 files.**
- **11/27/91 Survey Request from a CDFG Warden:** The Warden reported that a “source” claimed that 49 adult chinook salmon were in Dry Creek and Miners and Secret ravines, with most in Secret Ravine. A survey the next week found no adults or redds in Miners or Secret ravines. **Source: Unsigned, unidentifiable author note in CDFG, Region 2 files.**
- **1992-1993 Habitat Inventory by David Vanicek, Professor at California State University, Sacramento:** Vanicek reports conducting surveys along Miners Ravine in December 1992 and January 1993. No live fish were seen, but one carcass was observed on January 10, 1993 about 100 meters upstream of the confluence with Secret Ravine. **Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993, Copy from CDFG files, Region 2.**
- **11/24/93 Foot Survey from Sierra College Blvd. Downstream to Royer Park in Roseville:** A foot survey was conducted from Sierra College Blvd. downstream to Royer Park in Roseville. No fish were seen. **Source: Unsigned, unidentifiable author note in CDFG, Region 2 files.**
- **11/14/96 Warden Report:** A warden reported seeing 4 live adults and one carcass just upstream of the Sunrise Blvd. Bridge in Roseville. **Source: Unsigned, unidentifiable author note in CDFG, Region 2 files.**
- **1997 Spawning Gravel Survey by John Nelson, Department of Fish and Game:** Nelson surveyed the stream from the confluence with Secret Ravine to approximately 1.5 miles upstream in 1997. In this memorandum Nelson notes that the historical spawning run size in the Dry Creek Watershed is more than 1,000 fish with more than 60% occurring in Secret Ravine and more than 10% of the run occurring in Miners Ravine. **Source: 9/27/97 Memorandum from John Nelson, CDFG, Region 2 files.**
- **2000 E-mail Regarding Salmon Distribution:** This e-mail indicates that Gordon Cook, a caretaker at Hidden Valley, speared salmon in the 1960’s near Cottonwood Dam. **Source: Unsigned, unidentifiable author note in CDFG, Region 2 files.**
- **November 2001-February 2002 Habitat and Fish Passage Assessment by Department of Water Resources:** Department of Water Resources surveyed 12.9 miles

of the main channel from Secret Ravine upstream to near where King Road intersects Auburn Folsom Road in Loomis. During the course of the survey, they counted 14 carcasses and 3 live fish between November 20 and December 3, 2001. Although only GPS coordinates are given for the fish locations, it appears that all fish seen were downstream of the wetlands complex near Orivetto Drive in the City of Roseville. *[In the Biological Inventory Results section of Lee's report, three reports of adult chinook salmon in Miners Ravine are documented. First, "In 1965, DFG carcass surveys counted 27 adult Chinook salmon (Gerstung)." However, no citation is included in the references and no corresponding information was found in the CDFG files that I examined. Second, Lee reports that the 1992-93 surveys completed by Vanicek reported 10 carcasses in Miners Ravine; this is probably a typographic error, since Vanicek's report only documents 1 carcass. Third, Lee reports that Gerstung found "11 live fish and 17 carcasses" during surveys conducted February 16 to March 12, 1965. This information would suggest that adult chinook salmon are spawning in Miners Ravine at a time when no other known chinook salmon race in the Central Valley spawns. Based on review of the original reference, Lee apparently misinterpreted Gerstung's field data sheet information as adult chinook salmon spawning adults and carcasses, when Gerstung was actually reporting data on salmon fry. I confirmed this conclusion with Lee on 10/31/2003.]* **Source: Miners Ravine Habitat Assessment, Department of Water Resources, Chris Lee, author, October 2002.**

- **Summary of Dry Creek Conservancy Fall-run Chinook Salmon Surveys in Miners Ravine:** Dry Creek Conservancy members have been conducting foot surveys during the fall and early winter since 1997. Three reaches are described:
 1. Miner Ravine 1 (MR1): Confluence with Secret Ravine upstream to East Roseville Parkway Bridge (approximately 5,200 ft.)
 2. Miners Ravine 2 (MR2): East Roseville Parkway Bridge upstream to Sierra College Blvd. (approximately 9,200 ft.).
 3. Miners Ravine 3 (MR3): Within the Miners Ravine Nature Preserve near the southernmost Auburn Folsom Road crossing (approximately 4 miles upstream from Sierra College Blvd.).

Surveys usually begin about November 1 and continue until late December. No data has been reported for reach MR3. Two surveys were conducted in 1997, both in reach MR2, eight days apart with a total of 12 live fish and 5 carcasses reported. One survey was conducted on 11/15/98 in reach MR1 with 8 live fish reported. Figure 12 displays data for live and carcasses for 1999 (MR1 and MR2). Figures 13, 14, and 15 show the data for the years 2000, 2001, and 2002, respectively. Surveys have not been systematic or comprehensive, making population assessments impossible. **Source: Dry Creek Conservancy; unpublished data; Placer County Flood Control and Water Conservation District and Sacramento County Water Agency, Final Report: Dry Creek Watershed Flood Control Plan, April 1992, Table 5-1, reach lengths only.**

Figure 12. Summary of 1999 fall-run chinook salmon sampling surveys in Miners Ravine.

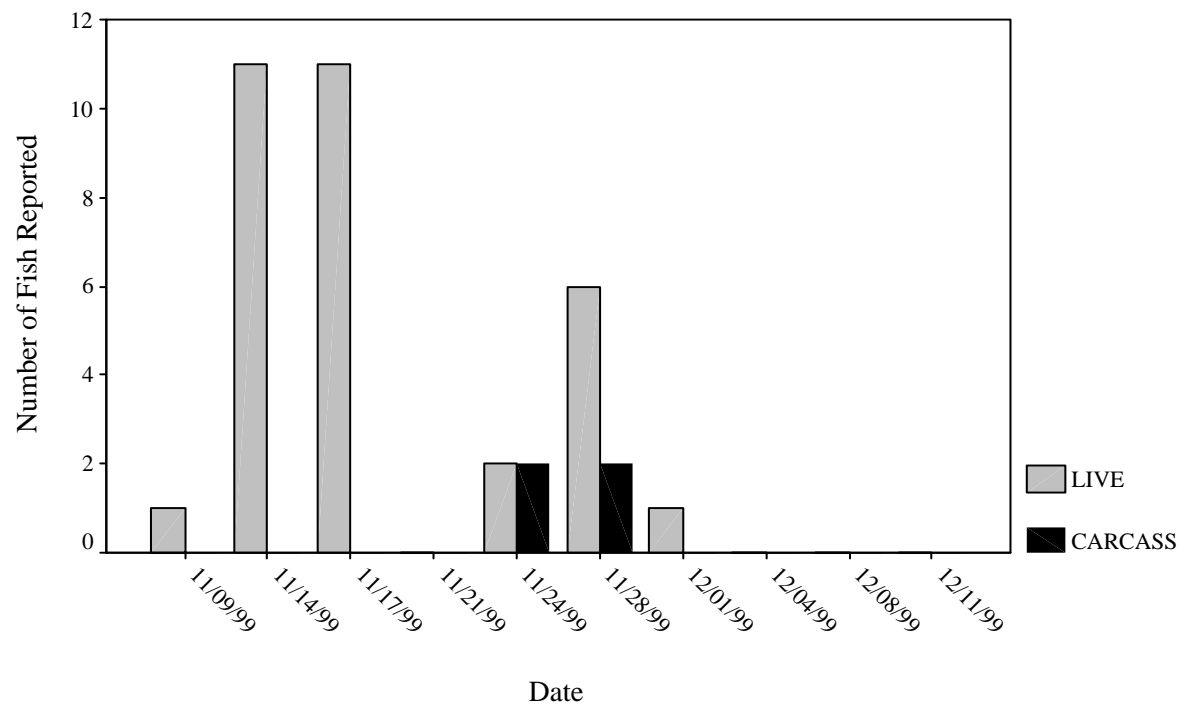


Figure 13. Summary of 2000 fall-run chinook salmon sampling surveys in Miners Ravine.

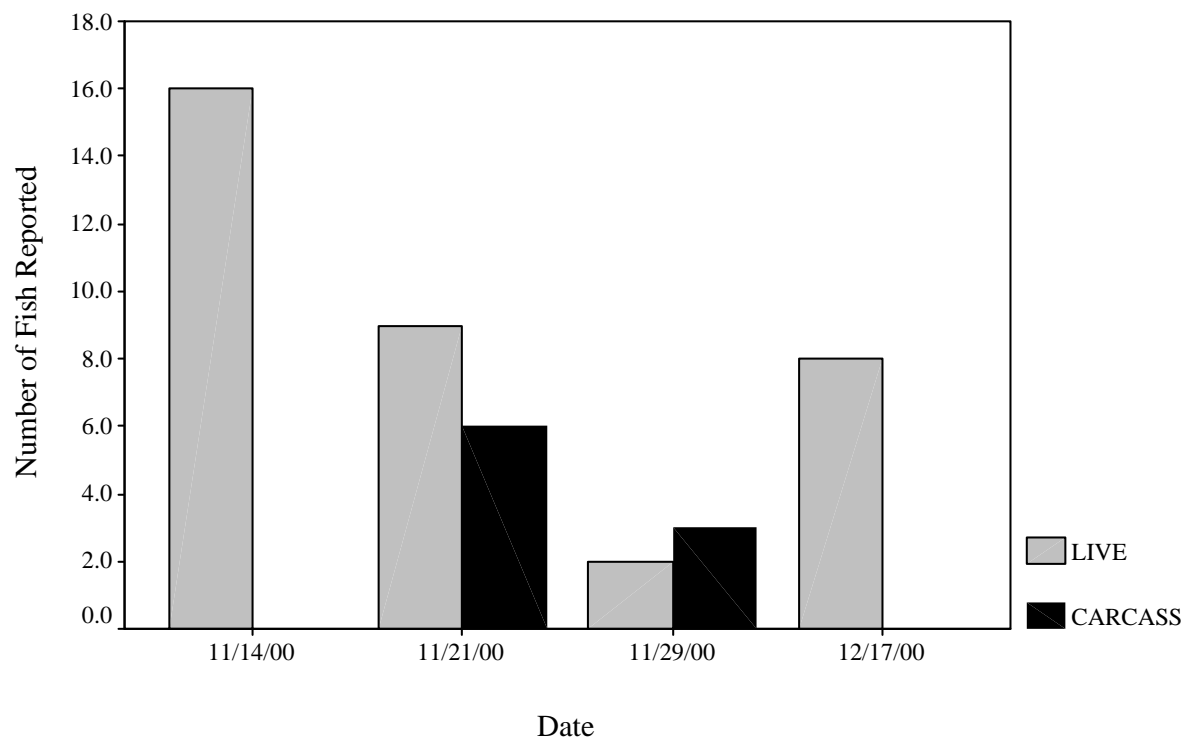


Figure 14. Summary of 2001 fall-run chinook salmon sampling surveys in Miners Ravine.

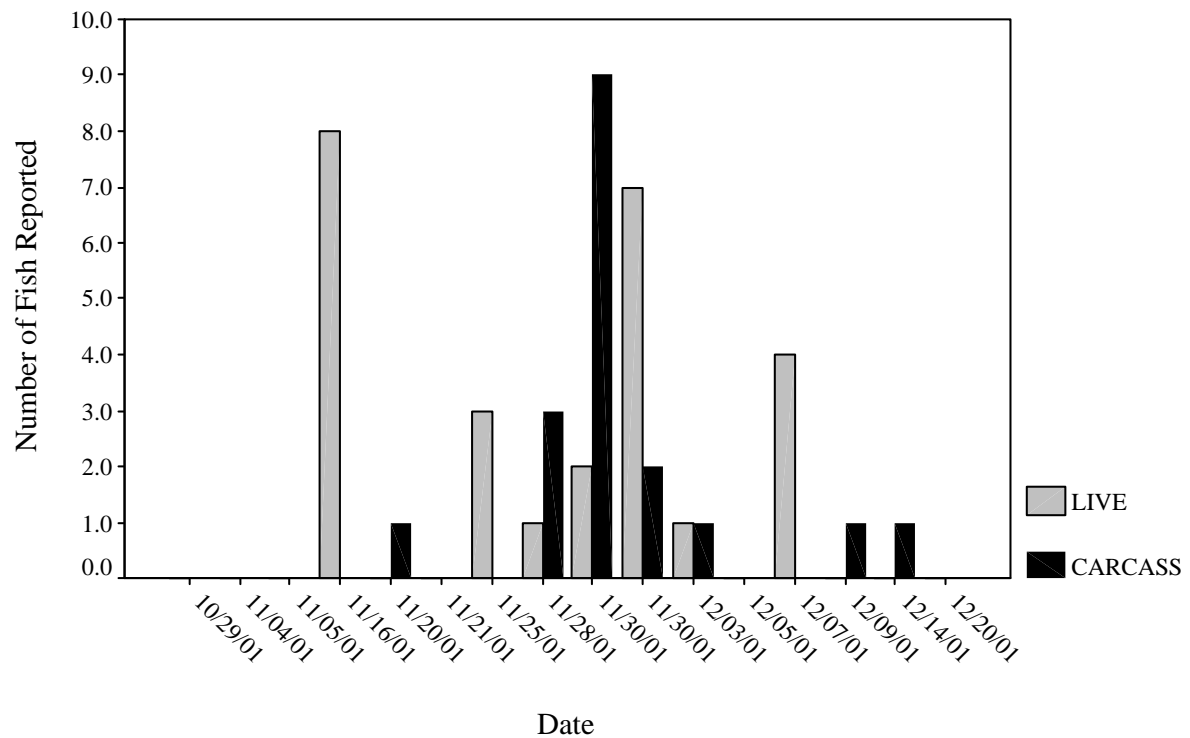
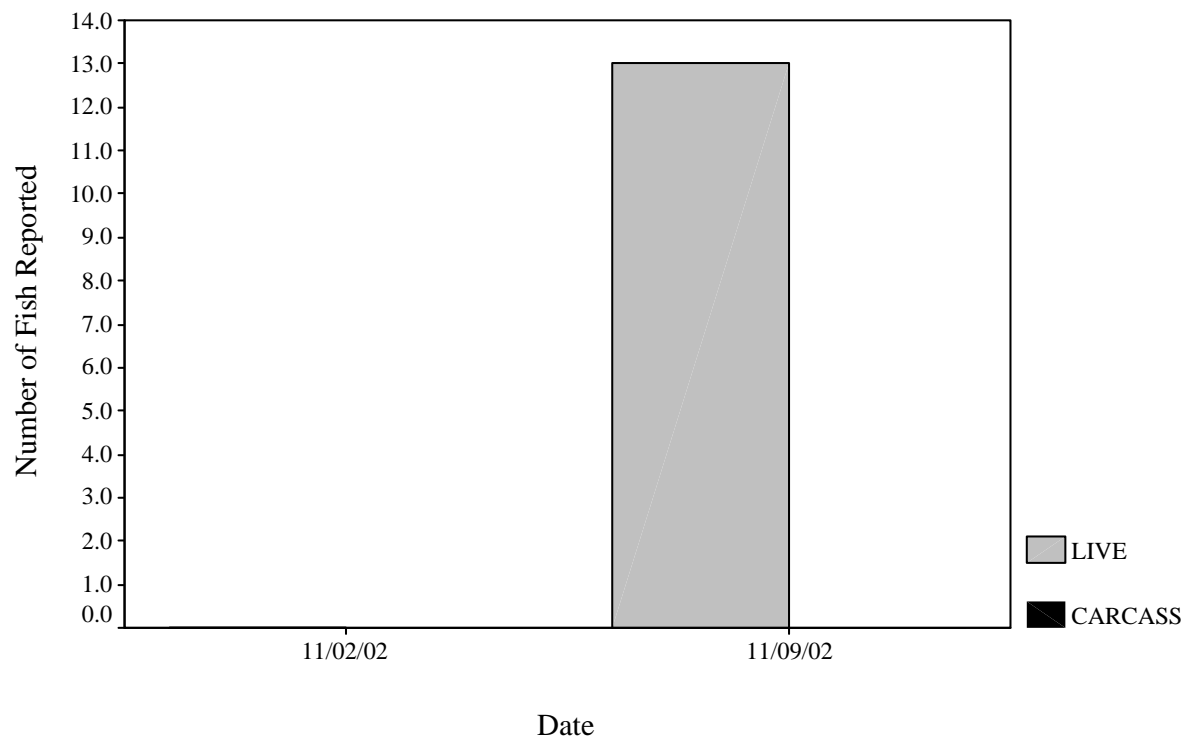


Figure 15. Summary of 2002 fall-run chinook salmon sampling surveys in Miners Ravine.



4. Juvenile Distribution and Sampling Data

- **Spring 1965 Fall-run Chinook Salmon Juvenile Emigration Survey by Eric Gerstung:** Gerstung began trapping for downstream migrant fall-run chinook salmon juveniles in Miners Ravine at a site about 100 yards downstream of Sierra College Blvd. on February 16, 1965 and continued through March 12, 1965. Sampling was with a “riffle” trap or perforated plate trap. The trap fished a total of 567 ¼ hours and captured 11 juvenile chinook salmon alive, with 17 dead recorded. Catch composition is noted as 10 crayfish, 1 brown bullhead, 3 green sunfish, 29 goldfish, 2 suckers, 5 hitch, 1 rainbow trout, 3 lamprey, and 1 squawfish. Water temperatures were reported as ranging from 45-55 °F during this time period. **Source: May 25, 1965 memorandum in CDFG, Region 2 files; handwritten draft of May 25, 1965 memo, and other handwritten notes.**
- **April 1986 One-time Electrofishing Event:** Jones and Stokes Associates conducted a one-time electrofishing event at two locations within the “plan area”. Two 50-meter reaches were electrofished for a total of 1 hour. Flows were characterized as “high”. Catch composition is presented in Table 2. **Source: DEIR, Northeast Roseville Specific Plan, October 1986.**

Table 2. Catch composition from a one-time electrofishing event at two locations on Miners Ravine during April 1986.

Species	Size Range (mm)	Number Captured
Sacramento pikeminnow (formerly squawfish)	68-189	9
Bluegill	69-120	3
Sacramento perch	48-54	2
Green sunfish	60-65	2
Steelhead trout	88-91	2
Brown bullhead	92	1

Source: DEIR, Northeast Roseville Specific Plan, October 1986.

- **1998-2000 Sampling in Miners Ravine by Rob Titus, California Department of Fish and Game:** Titus’ sampling consisted of electrofishing to determine distribution of rearing juvenile steelhead and rotary screw trapping to determine emigration timing. Sections of Miners Ravine, from the confluence with Secret Ravine upstream to King Road, were electrofished between November 5, 1998 and June 8, 1999. The rotary screw trap was placed about 100 m downstream of the confluence with Secret Ravine and fished from November 6, 1998 through June 2, 1999 and from January 9, 2000 through June 8, 2000.

Electrofishing only captured juvenile steelhead at the Dick Cook Road site and not at any other locations, upstream or downstream. Twelve juvenile steelhead were captured during two sampling events (mid-December 1998 and late March 1999) ranging in length from 72 to 400 mm FL and averaged 211 mm. These data indicate the presence of young-of-the-year steelhead as well as rearing yearling and older steelhead. Juvenile chinook salmon were captured in each of six sections from the stream mouth upstream to above the fourth bicycle-trail crossing in the City of Roseville’s Greenway. Titus also

concludes that Cottonwood Dam is a barrier to steelhead migration, but some fish must pass under higher flows, since juveniles were found upstream of the dam. Captures in the rotary screw trap included three fish (177-212 mm FL) between March 14th and April 7, 1999 and 10 smolts (160-238 mm FL) from Mar3, 2000 through April 28, 2000.

Titus's conclusions regarding Miners Ravine were:

“One notable difference between Secret and Miners ravines that may serve as an overall index of habitat quality for juvenile steelhead rearing was the composition of the fish fauna in each creek. Fishes in Secret Ravine transitioned from a spotted bass/Sacramento pikeminnow/Sacramento sucker dominated fauna in its lowermost reaches to a predominately native fish fauna including steelhead and lamprey in its upper reaches. In contrast, there was no longitudinal trend in catch composition on Miners Ravine. With the exception of juvenile steelhead at the Dick Cook road site, fishes were typically dominated by one or a combination of introduced warmwater species including cyprinids (namely golden shiners) and centrarchids (largemouth bass, bluegill, and other species) and proportionately very few observations of Sacramento pikeminnow and Sacramento sucker. That the fish fauna was so variable from site to site and consisted primarily of introduced warmwater fishes (except when juvenile chinook salmon were present in the creek below Cottonwood Dam) suggest that localized habitat conditions in the creek may also be highly variable, possible as a function of water quality and pond development within the system. Localized dominance of especially golden shiner may be indicative of high temperature and low dissolved oxygen conditions that are unsuitable for the native fishes in the system, especially steelhead.”

Titus's conclusions about water quality are supported by the data presented in the water quality section of this report. **Source: Memorandum from CDFG Biologist Rob Titus dated November 5, 2001, CDFG, Region 2 files.**

E. Fish Passage or Screening Data

Potential fish passage problems and locations are well documented in the “Miner Ravine Habitat Assessment” report from the Department of Water Resources. Since this was an on-the-ground assessment, complete with GPS coordinates, measurements of the individual potential barriers (e.g., beaver dams, flashboard dams, waterfalls, etc.) and physical descriptions and photos, this assessment is probably definitive. The DWR report documents 38 potential barriers in the area surveyed. **Source: Miners Ravine Habitat Assessment, Department of Water Resources, Chris Lee, author, October 2002.**

APPENDIX DRY CREEK 1

BENTHIC MACROINVERTEBRATE DATA COLLECTED BY THE DRY CREEK CONSERVANCY

[illegible][illegible]

					<i>Simulium sp.</i>	6	f	6	35	17	58	3	54	16	73	28	117	37	182
					Tipulidae	3													
					<i>Limonia sp.</i>	6	s												
					<u>Hemiptera</u>														
					Corixidae	8	p												
					<i>Sigara sp.</i>	8	p												
					<u>Megaloptera</u>														
					Sialidae	4	p												
					<i>Sialis sp.</i>	4	p												
					<u>Odonata</u>														
					Calopterygidae	5	p												
					<i>Hetaerina sp.</i>	6	p		1		1					1			1
					Coenagrionidae		p												
					<i>Argia sp.</i>	7	p	6	5	3	14	3	5	3	11	19	8	2	29
					Gomphidae	4	p												
					<i>Ophiogomphus occidentis.</i>	4	p					1			1	1			1
					Libellulidae	9	p												
					<i>Brechmorhoga mendax</i>	9	p	1		1	2		1		1			1	1
					<u>Lepidoptera</u>														
					Nepticulidae		s												
					Pyalidae	5										2			2
					<i>Petrophila sp.</i>	5	g			4	4	1	2	3	6				
					<u>Ephemeroptera</u>														
					Baetidae	4	g												
					<i>Baetis sp.</i>	5	c	22	55	72	149	6	21	20	47	19	48	56	123
					<i>Camelobaetidius sp.</i>	4	c			1	1								
					<i>Fallceon quilleri</i>	4	c		1		1		1		1				
					Caenidae	7	c												
					<i>Caenis sp.</i>	7	c												

[illegible]

[illegible]

PHYLUM MOLLUSCA																	
	Class Gastropoda																
		Pulmonata															
		Ancylidae	6	gg													
		<i>Ferrissia sp.</i>	6	gg	14	22	4	40	1	2	39	42					
		Lymnaeidae	6	gg													
		<i>Fossaria sp.</i>	8	gg													
		Physidae	8	gg													
		<i>Physa sp./ Physella sp.</i>	8	gg									1		1	2	
		Planorbidae	6	gg													
		<i>Gyraulus sp.</i>	8	gg													
		<i>Helisoma sp.</i>	6	gg	1			1	1		7	8					
		<i>Micromenetus sp.</i>	6	gg	1		1	2									
	Class Bivalvia																
		Pelecypoda	8	f													
		Corbiculidae	10	f													
		<i>Corbicula fluminea</i>	10	f		1		1	2	1	1	4	4	5	12	21	
		Sphaeriidae	8	f													
		<i>Pisidium sp.</i>	8	f													
PHYLUM NEMATODA			5	p		3	3	6	1	3		4	1	3	1	5	
PHYLUM PLATYHELMINTHES																	
	Class Turbellaria																
		Tricladida															
		Planariidae	4	p													
		<i>Dugesia tigrina</i>	4	p	3	2		5		3		3	10	4	9	23	
PHYLUM ANNELIDA																	
	Class Oligochaeta		5	c	7	32	14	53	9	4	1	14	22	10	6	38	
		Megadrili	5	c													
PHYLUM NEMERTEA																	
	Class Enopla																

					Tertastemmatidae																
							<i>Prostoma graecense</i>	8	p	10	3	1	14	3	2		5	18	8	10	36
							Total			315	318	328	961	282	281	311	874	283	285	286	854
							Taxa Richness			18	20	17	29	21	21	15	28	20	16	18	24
							Percent Dominant Taxon			44	23	31	32	77	51	61	63	18	41	25	21
							EPT Taxa			5	5	5	9	5	5	4	8	3	4	4	5
							EPT Index (%)			38.4	40.6	54.3	44.5	7.4	16.7	13.2	12.5	22.3	20.7	45.8	29.6
							Sensitive EPT Index			0.6	0.0	0.0	0.2	0.4	0.7	0.0	0.3	0.0	0.4	0.3	0.2
							Ephemeroptera Taxa			2.0	2.0	2.0	4.0	1.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
							Plecoptera Taxa			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							Trichoptera Taxa			3.0	3.0	3.0	5.0	4.0	3.0	3.0	6.0	1.0	2.0	2.0	3.0
							Dipteran Taxa			4.0	3.0	3.0	4.0	4.0	4.0	3.0	5.0	4.0	3.0	4.0	4.0
							Percent Dipteran			47.0	34.9	35.7	39.1	83.3	74.0	68.2	74.9	34.3	59.3	25.2	39.6
							Non-Insect Taxa			7.0	10.0	6.0	12.0	9.0	9.0	6.0	11.0	9.0	8.0	8.0	10.0
							Percent Non-Insect			12.4	22.6	7.6	14.2	7.4	6.4	16.7	10.4	35.3	17.2	28.0	26.8
							Percent Chironomidae			45.1	23.9	30.5	33.1	82.3	54.8	63.0	66.6	24.4	18.2	12.2	18.3
							Percent Hydropsychidae			29.2	22.3	30.8	27.5	3.2	7.8	4.8	5.3	11.3	2.8	24.8	13.0
							Percent Baetidae			7.0	17.6	22.3	15.7	2.1	7.8	6.4	5.5	6.7	16.8	19.6	14.4
							Shannon Diversity			1.7	2.1	1.7	1.9	1.1	1.7	1.5	1.6	2.6	1.9	2.2	2.4
							Tolerance Value			5.3	5.3	5.1	5.3	5.9	5.7	5.8	5.8	5.7	5.8	5.7	5.7
							Percent Intolerant (0-2)			0.6	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							Percent Tolerant (8-10)			4.4	3.5	1.2	3.0	2.8	1.8	1.3	1.9	15.9	8.4	22.7	15.7
							Percent Collectors			55.2	52.2	57.0	54.8	88.3	64.8	70.1	74.3	50.2	42.1	35.0	42.4
							Percent Filterers			31.7	34.0	36.9	34.2	5.0	28.5	10.3	14.4	22.6	46.0	42.0	36.9
							Percent Grazers			5.7	7.2	3.0	5.3	2.8	1.4	17.7	7.7	0.4	0.0	0.3	0.2
							Percent Predators			7.3	6.6	3.0	5.6	3.9	5.3	1.9	3.7	26.1	11.9	22.7	20.3
							Percent Shredders			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							Total Percentages			100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	100.0	100.0	99.8
							Total Abundance			1890	1531	1312		1354	3372	1866		849	1140	1144	

Dry Creek Benthic Macroinvertebrate CSBP Summary Metrics, 2000 - 2001									
	Miner's Ravine			Miner's Ravine @ Secret Ravine			Miner's Ravine @ Dick Cook Rd.		
	2000			2001			2001		
	Mean	CV	Total	Mean	CV	Total	Mean	CV	Total
Taxa Richness	18.3	8.3	29.0	19.0	18.2	28.0	18.0	11.1	24.0
Percent Dominant Taxon	32.6	33.8	32.3	63.0	21.4	62.9	27.8	43.0	21.3
EPT Taxa	5.0	0.0	9.0	4.7	12.4	8.0	3.7	15.7	5.0
EPT Index (%)	44.4	19.4	44.5	12.5	37.6	12.5	29.6	47.5	29.6
Sensitive EPT Index	0.2	173.2	0.2	0.4	100.1	0.3	0.2	86.6	0.2
Ephemeroptera Taxa	2.0	0.0	4.0	1.3	43.3	2.0	2.0	0.0	2.0
Plecoptera Taxa	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0
Trichoptera Taxa	3.0	0.0	5.0	3.3	17.3	6.0	1.7	34.6	3.0
Dipteran Taxa	3.3	17.3	4.0	3.7	15.7	5.0	3.7	15.7	4.0
Percent Dipteran	39.2	17.3	39.1	75.2	10.2	74.9	39.6	44.6	39.6
Non-Insect Taxa	7.7	27.2	12.0	8.0	21.7	11.0	8.3	6.9	10.0
Percent Non-Insect	14.2	54.0	14.2	10.2	55.7	10.4	26.8	34.0	26.8
Percent Chironomidae	33.2	32.7	33.1	66.7	21.1	66.6	18.3	33.2	18.3
Percent Hydropsychidae	27.4	16.4	27.5	5.3	44.5	5.3	13.0	85.5	13.0
Percent Baetidae	15.6	50.1	15.7	5.5	54.4	5.5	14.4	47.1	14.4
Shannon Diversity	1.8	12.3	1.9	1.4	20.8	1.6	2.2	14.4	2.4
Tolerance Value	5.3	2.5	5.3	5.8	1.7	5.8	5.7	1.4	5.7
Percent Intolerant (0-2)	0.2	173.2	0.2	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0
Percent Tolerant (8-10)	3.0	54.3	3.0	2.0	40.3	1.9	15.7	45.6	15.7
Percent Collectors	54.8	4.4	54.8	74.4	16.6	74.3	42.4	17.9	42.4
Percent Filterers	34.2	7.5	34.2	14.6	84.6	14.4	36.8	33.9	36.9
Percent Grazers	5.3	39.7	5.3	7.3	123.1	7.7	0.2	86.6	0.2
Percent Predators	5.7	40.4	5.6	3.7	46.0	3.7	20.3	36.6	20.3
Percent Shredders	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0	0.0	#DIV/0!	0.0